

# *Project Baseline Summary Report*

Data Source: **EM CDB**

Operations/Field Office: **Idaho**

Site Summary Level: **Idaho National Engineering and Environmental Laboratory**

Project **ID-OIM-106 / Electrical and Utility Systems Upgrade (EUSU) Project, ICPP**

Report Number: **GEN-01b**

Print Date: **3/10/2000**

HQ ID: **0210**

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## **General Project Information**

### **Project Description Narratives**

#### **Purpose, Scope, and Technical Approach:**

Definition of Scope: The EUSU Project will upgrade the Idaho Nuclear Technology and Engineering Center (INTEC) utility systems by correcting high risk life-safety and health deficiencies. Correction of these deficiencies will reduce environmental safety and health risks and provide safe and reliable utilities to support the INTEC SNF and HLW mission. The INTEC electrical and utility supply and distribution system supports all plant operations. This system is outdated, overloaded, and not in compliance with national codes and standards or DOE Orders. These factors, combined with plant-wide growth, have utilized the capacity of the distribution system and increased the potential safety and health risks associated with long-term use and maintenance of the INTEC utility systems. Expected future needs to support the Idaho State Settlement Agreement will exceed the current system capacity further increasing the safety and health risks of the INTEC electrical utility systems.

The scope of this project includes upgrades to the normal and standby power electrical systems. The system upgrades, improvements, and corrections, listed in order of priority, include:

- \* Installation of a new 13.8 kV medium voltage electrical ductbank and manhole system to correct medium-low voltage separation safety and code compliance problems.
- \* Modification, relocation, or new installation of 13.8 kV substations and 13.8 kV/480 v load centers to eliminate overloaded conditions and fault current deficiencies on existing electrical distribution equipment.
- \* Upgrades to the existing stand-by power network and control system, and the installation of new diesel generators to eliminate existing overloaded conditions and provide reliable stand-by power during commercial power outages to equipment that provides for containment and control of radioactive and fissile materials, environmental monitoring, security functions, and personnel and property protection.
- \* Replacement of numerous 20-40 year old panelboards and associated switchgear in existing buildings that present a significant fire hazard.
- \* Reconfiguration of electrical service equipment in several existing buildings to eliminate multiple electric service entrances that violate code and constitute fire and safety hazards for workers and occupants.

Technical Approach: A new, underground electrical ductbank will be installed to route the 13.8kV medium voltage electrical system. The existing ductbank system will be retained for the low voltage distribution system. Substations and load centers will be replaced or modified to eliminate overloaded conditions and fault current deficiencies. Two of the existing diesel generators and newly purchased generators will be connected to the standby power distribution and control system to correct overloaded conditions and provide reliable power using load sharing and shedding based on a prioritized list of demands. Obsolete electrical panels will be replaced in existing buildings. The existing multiple feeds (instances in which power is fed into a building from several different entry points) in buildings will be consolidated into single feeds to eliminate code deficiencies and improve worker safety.

Design will be performed by the operating contractor's Facility Engineering (design) Organization. Construction and procurement will be accomplished by fixed price contracts and subcontracts awarded on the basis of competitive bidding to the maximum extent feasible. A portion of the facility construction work will be performed by the contractor's force account personnel due to the number of changed conditions expected in some of the older, contaminated facilities. Title III inspection will be accomplished by the operating contractor. DOE-ID will provide oversight of the project.

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### **Project Status in FY 2006:**

In service - This project will be constructed and fully operational by 2006.

### **Post-2006 Project Scope:**

Not Applicable

### **Project End State**

At the completion of this project the INTEC utility system's high risk life-safety and health deficiencies will be corrected. Correction of these deficiencies will reduce environmental, safety and health risks and provide safe and reliable utilities to support the INTEC SNF and HLW mission. No other project will be required to meet the project end state.

### **Cost Baseline Comments:**

Contingency of 22% (including management reserve) was allocated for capital costs at the end of Conceptual Design. Project Cost estimates are developed at each phase of the project per the INEEL Cost Estimating Guide. These phases are identified as (1) Conceptual design, (2) Title I Design, (3) Title II Design, and (4) Approved for Construction (AFC). These estimates change through time as a part of the normal design evolution and further definition of project uncertainties based on items such as completeness of design (e.g. conceptual versus AFC), construction complexity, subcontract award value, and approved baseline plan changes. At each project phase, a contingency analysis is performed to determine that the appropriate level of contingency required to complete the project is available. The contingency is now 15% of the capital costs based on the completion of Title Design and the most recent cost estimates.

Cost Baselines will be reviewed in the respective design reports to ensure that the project is designed to cost. The estimates for each project phase will reflect the current cost baselines.

Total Project Cost = \$67,849 K including \$42,851K received to date in FY 1999.

### **Safety & Health Hazards:**

The overloaded and degraded electrical system is one of the most significant concerns at the INTEC for worker safety and health. A DOE Capital Asset Management Process (CAMP) study was conducted on the existing electrical distribution system by Raytheon Engineers and Constructors in FY-93. The EUSU Project included in its scope those systems/components which had CAMP scores exceeding 60. CAMP scores greater than 60 indicate serious incidents are likely to occur unless corrected, (e.g., electrocutions, fire, explosions).

The present electrical system poses a serious threat for worker injury or death from electrocution, explosion, or fire during operation of or while working on or in the vicinity of overloaded, aged/degraded, and/or non-code electrical equipment. Electrical equipment is subject to corrective maintenance and preventive maintenance on a regular basis exposing workers to potential risks during these activities. The INTEC electrical system is distributed through all areas of the INTEC placing it in the vicinity of other systems/equipment where work may be performed or personnel may be located. The overloaded and fault-current protection deficient electrical system is at high risk of failure with possible explosions and subsequent fires which can cause personal injury or death, collateral property damage, and/or process operations impacts or shutdowns.

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## **Project Description Narratives**

The present overloaded and unreliable Standby Power System's failure to auto start during a power outage will cause the loss of important systems and equipment needed for operations at INTEC. The Standby Power System provides backup power to contamination control ventilation blowers, radiation and environmental monitoring equipment, security equipment, and personnel and property protection equipment.

Failure to complete these corrective actions may result in system failure, fire, or worker injury/death which would delay completion of treatment activities identified in the Idaho State Settlement Agreement. In order to meet Settlement Agreement milestones in a responsible and safe manner, the proposed upgrades must be completed. Reduction of known deficiencies also permits more effective use of existing resources, and serves as a reminder to employees of company initiatives promoting safety including the Voluntary Protection Program (VPP) and the enhanced Work Planning Process.

### **Safety & Health Work Performance:**

Performance of work is controlled by LMITCO company procedures implementing national codes and standards and DOE Order requirements. Design work is performed in a formal manner following a project approved design requirements document (reviewed and approved by company S & H professionals) and company procedures which implement a disciplined approach to the design as well as design oversight by independent reviewers. The design review process ensures that safety and health aspects of the design are reviewed by independent company professionals, and that their comments are addressed and incorporated into the design. This review includes the aspects of constructibility and operability of the completed design.

Unique construction safety and health issues are identified prior to construction subcontract award through safety analysis documents and formal hazards reviews. Subcontractors are required to implement current LMITCO company requirements as defined in the company ES&H manual for construction subcontracts. The subcontractor is required to prepare and implement a health and safety plan that invokes requirements equivalent to LMITCO procedures. The subcontractor health and safety plan is reviewed by LMITCO safety professionals prior to issuing the notice to proceed for construction activities. Safety surveillance of the construction site and construction activities is required to be performed by the subcontractor on a regular basis and is supplemented by a LMITCO construction management weekly safety surveillances as well as periodic safety professional surveillances. All subcontractors are required to implement a stop work authority in their subcontract safety plan.

Following construction completion and prior to the performance of SO Testing, an occupancy safety walk through is performed by project, construction, operations and safety personnel to ensure that testing can be performed in a safe manner and that the system/facility is complete. Following successful SO Testing a facility acceptance review is conducted to ensure no outstanding deficiencies exist and the system/facility is ready for turnover to operations. This review/walkthrough also includes the necessary safety professionals.

### **PBS Comments:**

The overloaded and degraded ICPP electrical distribution system is at risk of failure with subsequent negative impacts on ICPP process operations. This could result in shutdowns of High-Level Waste or Spent Nuclear Fuel operations and inability to comply with the Idaho State Settlement Agreement. The serious injury of workers, operations shutdowns, or fires would result in unfavorable media coverage and lead to the negative perceptions of the INEEL by the public.

Priorities have been determined for individual items within this work scope. Should less than full funding be provided for this project some of the

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## Project Description Narratives

identified safety and code compliance deficiencies would remain in place. Specific work scope reductions would first occur in the replacement and upgrading of the facility electrical upgrades. This could increase the risk of electrical failure in existing facilities where work necessary to meet Settlement Agreement milestones is accomplished, e.g. calcination, fuel movements, and fuels storage.

Other Driver Reference (Sec. A.2.19):

ANSI/NESC: National Electric Safety Code

OSHA 29 CFR 1910 Subpart R: Special Industries

OSHA 29 CFR 1910 Subpart S: Electrical Wiring Design and Protection; Wiring Methods; Etc.

OSHA 29 CFR 1926 Subpart K: Electrical Wiring Design and Protection; Wiring Methods; Etc.

40 CFR 60: Environmental Monitoring

Other Related Projects (Sec. A.2.17):

ID-OIM-01 INEEL Infrastructure Operations, ID-OIM-02 INEEL Infrastructure Construction, and Deactivation/Decommissioning projects ID-OIM-09 through ID-OIM-12.

### Baseline Validation Narrative:

A joint senior level DOE-ID and LMITCO Independent Murder Board Review of the INEEL decision units was conducted in 1996. Six teams consisting of six members each reviewed the scope of work, schedule, cost estimates and basis of estimates for each of the decision units which are the same base element used to construct the draft PBS.

In 1998, an independent validation was performed by DOE-ID to review and validate the purpose, scope of work, schedule, cost estimates, and basis of estimates for the PBS.

Independent technical reviews of the project's adequacy are performed by Power Engineers, Hailey, Idaho.

## General PBS Information

<b>Project Validated?</b>	Yes	<b>Date Validated:</b>	6/5/1998					
<b>Has Headquarters reviewed and approved project?</b>	No							
<b>Date Project was Added:</b>	12/1/1997							
<b>Baseline Submission Date:</b>								
<b>FEDPLAN Project?</b>	Yes							
<b>Drivers:</b>	<b>CERCLA</b>	<b>RCRA</b>	<b>DNFSB</b>	<b>AEA</b>	<b>UMTRCA</b>	<b>State</b>	<b>DOE Orders</b>	<b>Other</b>
	N	N	N	N	N	N	Y	Y

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## General PBS Information

### Project Identification Information

DOE Project Manager: Wayne B. Shigley  
DOE Project Manager Phone Number: 208-526-1986  
DOE Project Manager Fax Number: 208-526-9150  
DOE Project Manager e-mail address: SHIGLEWB@inel.gov  
Is this a High Visibility Project (Y/N):

## Planning Section

### Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	
PBS Baseline (current year dollars)	57,008	0	57,008	11,726	8,813	17,466	12,043	13,584	12,879	905	448	0	0	0	0	
PBS Baseline (constant 1999 dollars)	56,597	0	56,597	11,726	8,813	17,466	12,043	13,584	12,540	863	418	0	0	0	0	
PBS EM Baseline (current year dollars)	57,008	0	57,008	11,726	8,813	17,466	12,043	13,584	12,879	905	448	0	0	0	0	
PBS EM Baseline (constant 1999 dollars)	56,597	0	56,597	11,726	8,813	17,466	12,043	13,584	12,540	863	418	0	0	0	0	
	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Project ID-OIM-106 / Electrical and Utility Systems Upgrade (EUSU) Project, ICPP

	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS EM Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.70%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%
2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

## Project Reconciliation

### Project Completion Date Changes:

Previously Projected End Date of Project: 12/1/2002

Current Projected End Date of Project: 12/1/2002

Explanation of Project Completion Date Difference (if applicable):

The project TCP has not changed.

### Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	56,671	Actual 1997 Cost:	8,813	Actual 1998 Cost:	12,043
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	35,815	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			967
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	36,782				

### Project Cost Changes

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## Project Reconciliation

### Cost Adjustments Reconciliation Narratives

Cost Change Due to Scope Deletions (-):

Cost Reductions Due to Efficiencies (-):

Cost Associated with New Scope (+):

Cost Growth Associated with Scope Previously Reported (+):

Cost Reductions Due to Science & Technology Efficiencies (-):

Subtotal: 36,782

Additional Amount to Reconcile (+): -9,377 Project TPC has not changed from last year. The discrepancy is caused by BA/BO differences.

Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 27,405

## Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Project Mission Complete	OIM-06-005		12/1/2002								
Project Start			4/1/1997								

## Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Project Mission Complete	OIM-06-005				Y						
Project Start				Y							